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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/580,848	OKINO ET AL.
Office Action Summary	Examiner	Art Unit	
	GREGORY A. KESSLER	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>26 May 2006</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-13</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-13</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>26 May 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>05/26/2006, 06/30/2009</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-13 are presented for examination.

Specification

2.   The title of the invention is not descriptive. A new title is required that is clearly

indicative of the invention to which the claims are directed.

3.   The disclosure is objected to because of the following informalities:

- In Paragraph [0001], Line 6, "an main" is unclear.

- In Paragraph [0001], Line 7, and multiple other locations throughout the
specification (Paragraph [0002], Line 2, Paragraph [0003], Line 1, and
many others), "OS's" should be in plural form and not possessive form.

- In Paragraph [0002], Line 1, "multi operating" should be "multi-operating".

- In Paragraph [0004], Line 2, "multi OS" should be "multi-OS".

- In Paragraph [0006], Line 5, "time sharing" should be "time-sharing".

- In Paragraph [0007], Lines 4-5, "the processor cannot be used by the
other processor" is unclear.

- In Paragraph [0008], Line 3, "an main" is unclear.

- In Paragraph [0009], Line 6, "interrupt enabled" should be "interrupt-
enabled" and "interrupt disabled" should be "interrupt-disabled".

- In Paragraph [0010], Lines 6-7, "interrupt enabled" should be "interrupt-
enabled" and "interrupt disabled" should be "interrupt-disabled".

- In Paragraph [0011], Line 5, "interrupt enabled" should be "interrupt-enabled" and "interrupt disabled" should be "interrupt-disabled".

- In Paragraph [0013], Line 8, "interrupt disabled" should be "interrupt-disabled".

- In Paragraph [0013], Line 12, "interrupt enabled" should be "interrupt-enabled".

- In Paragraph [0013], Line 18, "high priority" should be "high-priority".

- In Paragraph [0013], Line 20, "low priority" should be "low-priority".

- In Paragraph [0014], Line 15, "high priority" should be "high-priority".

- In Paragraph [0014], Line 17, "low priority" should be "low-priority".

Appropriate correction is required.

4.   35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are shown above under heading number two.

5.   Claims 1-3, 5-9, and 11-13 are objected to because of the following informalities:

- In multiple cases, "interrupt enabled" should be "interrupt-enabled".

- In multiple cases, "interrupt disabled" should be "interrupt-disabled".

- In multiple cases, "sub operating system" should be "sub-operating system".

- In claim 7, line 16, "other than an main operating system" is unclear.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7.   Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

    a.   The claim language of the following claims is not clearly understood:

        i.   As to claim 1, line 15, claim 7, line 18, and claim 13, line 18, it is unclear what it means for an operating system to be in an "interrupt enabled state" or an "interrupt disabled state". For purposes of this action, it is assumed to mean that the operating system is either accepting interrupts (enabled) or ignoring them (disabled).

        ii.   As to claim 1, lines 18-19, claim 7, lines 22-23, and claim 13, lines 22-23, it is unclear what is "based on the status information". Is it the controlling of an interrupt process or the generation of the interrupt that is based on the status information?

iii.   As to claim 5, line 22 and claim 11, line 22, it is unclear whether the

"or" in the claims means that (a) is done as either (a1) or (a2) and (b) is

done separately or if (a) is done as either (a1) or ((a2) and (b)). For

purposes of this action, it is assumed that (a) is done as either (a1) or

((a2) and (b)).

Claim Rejections - 35 USC § 101

8.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
conditions and requirements of this title.

9.   Claims 1-6 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. As to claim 1, the claimed invention is directed

to an apparatus, but appears to be comprised of software alone without claiming

associated computer hardware required for execution. The operating systems are

never expressly defined as physical elements and can therefore be just a piece of code.

Software alone is directed to non-statutory subject matter. As to claims 2-6, they do not

cure the deficiencies of the claim on which they depend. Therefore, they are rejected

for the same reasons.

10.   Claims 7-12 are rejected under 35 U.S.C. 101 as not falling within one of the four

statutory categories of invention. As to claim 7, the claim recites a series of steps or

acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to

particular machine, or (2) transform underlying subject matter (such as an article or

material) to a different state or thing.   See page 10 of In Re Bilski 88 USPQ2d 1385.

The instant claim is neither positively tied to a particular machine that accomplishes the

claimed method steps nor transform underlying subject matter, and therefore, does not

qualify as a statutory process. As to claims 8-12, they do not cure the deficiencies of

the claim on which they depend. Therefore, they are rejected for the same reasons.

11.   Claim 13 is rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. The claimed invention is directed to an

computer program and appears to be comprised of software alone without claiming

associated computer hardware required for execution. Software alone is directed to

non-statutory subject matter.

Claim Rejections - 35 USC § 103

12.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

13.   This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

14.   Claims 1, 3, 7, 9 and 13 are rejected under 35 U.S.C. 103(a) as being

unpatentable over England et al (**U.S. Pat. Pub. No. 2004/0230794 A1, hereinafter

England**) in view of Nota et al (**U.S. Pat. No. 5805790, hereinafter Nota**).

        Nota was cited in the IDS dated 05/26/2006.

15.   <u>As per claim 1</u>, England teaches the limitations substantially as claimed,

including an information processing apparatus for processing data, the information

processing apparatus comprising:

        a plurality of operating systems (Abstract, Lines 1-2), the plurality of operating

systems including a main operating system controlling an interrupt process (Paragraph

[0119], Lines 1-8) and a sub operating system (Abstract, Lines 1-4), the main operating

system, along with a system control operating system set as the sub operating system,

setting a logical partition as a process unit, and managing a hardware resource relating

to the logical partition (Paragraph [0007], Lines 1-8), the sub operating system operating

within the logical partition set by the main operating system and the system control

operating system (Paragraph [0007], Lines 1-8), and executing a software application

program with the hardware resource assigned to the logical partition (Paragraph [0086],

Lines 1-6), and the main operating system controlling the interrupt process to perform

one of an interrupt process execution and an interrupt process reserve (Paragraph

[0119], Lines 1-8).

England does not expressly teach the main operating system storing status

information as to whether the sub operating system is in an interrupt enabled state or an

interrupt disabled state and that the controlling of the interrupt process is done in

response to the generation of the interrupt based on the status information.

However, Nota teaches the main operating system storing status information as

to whether the sub operating system is in an interrupt enabled state or an interrupt

disabled state and that the controlling of the interrupt process is done in response to the

generation of the interrupt based on the status information (Figure 2; Figure 14; Col. 15,

Lines 44-50).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to combine the teachings of Nota with those of England in order to ensure that

England's apparatus was aware of when an interrupt occurred in a guest operating

system so that the interrupt could be handled properly.

16.   As per claim 3, Nota teaches that the sub operating system notifies the main

operating system of the status information as to whether the sub operating system is in

the interrupt enabled state or the interrupt disabled state (Col. 4, Lines 50-51), and

wherein the main operating system updates the status information of the sub operating

system in response to the notification from the sub operating system (Figure 2; Figure

14; Col. 15, Lines 44-50).

17.   As per claim 7, it is a method claim of apparatus claim 1 with an additional

limitation. Those limitations that correspond to limitations from claim 1 are rejected for

the same reasons.

       As to the further limitations, Nota teaches detecting the generation of an interrupt

(Col. 15, Lines 39-40).

18.   As per claim 9, it is a method claim of apparatus claim 3. Therefore, it is rejected

for the same reasons.

19.   As per claim 13, it is a computer program claim of apparatus claim 1 with an

additional limitation. Those limitations that correspond to limitations from claim 1 are

rejected for the same reasons.

       As to the further limitations, Nota teaches detecting the generation of an interrupt

(Col. 15, Lines 39-40).

20.   Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over

England and Nota, as applied to claim 1 above, and further in view of Brelsford et al

(**U.S. Pat. No. 4674038, hereinafter Brelsford**).

21.   <u>As per claim 2</u>, Nota teaches that the main operating system stores interrupt

process status information (Figure 2; Figure 14; Col. 15, Lines 44-50) and resumes the

interrupt process execution in response to the transition of the sub operating system

between the interrupt enabled state and the interrupt disabled state (Col. 16, Lines 35-

40).

        England and Nota do not expressly teach that the status information includes

information as to whether the interrupt process is in progress or in reserve.

        However, Brelsford teaches that the status information includes information as to

whether the interrupt process is in progress or in reserve (Col. 2, Lines 42-45).

        It would have been obvious to one of ordinary skill in the art to combine the

teachings of Brelsford with those of England and Nota in order to ensure that England's

and Nota's main operating system had as much information as was available to use in

handling interrupts in sub operating systems.

22.   <u>As per claim 8</u>, it is a method claim of apparatus claim 2. Therefore, it is rejected

for the same reasons.

23.   Claims 4, 6, 10, and 12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over England and Nota, as applied to claim 1 above, and further in view of

Balasubramanian (**U.S. Pat. No. 6633942**).

24.   <u>As per claim 4</u>, England and Nota do not expressly teach that the main operating

system stores priority information of the interrupt process, and performs the interrupt

process responsive to the priority information.

        However, Balasubramanian teaches that the main operating system stores

priority information of the interrupt process, and performs the interrupt process

responsive to the priority information (Col. 4, Lines 3-5).

        It would have been obvious to one of ordinary skill in the art at the time of the

invention to combine the teachings of Balasubramanian with those of England and Nota

in order to ensure that England's and Nota's main operating system handled interrupts

in an order that allowed the most important computing tasks to be completed efficiently.

25.   <u>As per claim 6</u>, Nota teaches that the main operating system performs status

management based on a status table containing the status information of the sub

operating system and the interrupt process status information (Figure 2; Figure 3;

Figure 14; Col. 15, Lines 44-50) and England teaches that if an interrupt intended for

the main operating system is generated, performs interrupt control depending on

whether the operating system operating on a processor is either the main operating

system or the sub operating system in a manner such that

(a) if the main operating system is in operation, the main operating system

executes the interrupt process (Paragraph [0116], Lines 1-6), and that

(b) if the sub operating system is in operation, the main operating system

(b1) executes the interrupt process in response to a high priority interrupt

(Paragraph [0119], Lines 1-8), or

(b2) reserves the interrupt process in response to a low priority interrupt.

England and Nota do not expressly teach priority levels of interrupts.

However, Balasubramanian teaches priority levels of interrupts (Col. 4, Lines 3-

5).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to combine the teachings of Balasubramanian with those of England and Nota

in order to ensure that England's and Nota's main operating system handled interrupts

in an order that allowed the most important computing tasks to be completed efficiently.

26. <u>As per claims 10 and 12</u>, they are method claims of apparatus claim 4 and 6,

respectively. Therefore, they are rejected for the same reasons.

27.   Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

England and Nota, as applied to claim 1 above, and further in view of Brelsford, and still

further in view of Tanaka et al (**U.S. Pat. No. 5499379, hereinafter Tanaka**).

28.   <u>As per claim 5</u>, Nota teaches that the main operating system performs status

management based on a status table containing the status information of the sub

operating system and the interrupt process status information (Figure 2; Figure 3;

Figure 14; Col. 15, Lines 44-50). England further teaches that if an interrupt intended

for the sub operating system is generated and the main operating system determines

based on the status table that the sub operating system is in the interrupt enabled state,

performs interrupt control depending on whether the operating system operating on a

processor is either the main operating system or the sub operating system in a manner

such that

        (a) if the main operating system is in operation, the main operating system

        (a1) executes the interrupt process in response to a high priority interrupt, or

        (a2) reserves the interrupt process in response to a low priority interrupt, and that

        (b) if the sub operating system is in operation, the main operating system

executes the interrupt process regardless of the priority level of the interrupt (Paragraph

[0119], Lines 1-8 teaches that the main operating system executes an interrupt

generated for the sub operating system when the main operating system is in

operation).

England and Nota do not teach that the status information includes information

as to whether the interrupt process is in progress or in reserve or that if an interrupt

intended for the sub operating system is generated and the main operating system

determines based on the status table that the sub operating system is in the interrupt

disabled state, registers the interrupt in the status table as a reserved interrupt.

However, Brelsford teaches that the status information includes information as to

whether the interrupt process is in progress or in reserve (Col. 2, Lines 42-45).

It would have been obvious to one of ordinary skill in the art to combine the

teachings of Brelsford with those of England and Nota in order to ensure that England's

and Nota's main operating system had as much information as was available to use in

handling interrupts in sub operating systems.

England, Nota, and Brelsford do not teach that if an interrupt intended for the sub

operating system is generated and the main operating system determines based on the

status table that the sub operating system is in the interrupt disabled state, registers the

interrupt in the status table as a reserved interrupt.

However, Tanaka teaches that that if an interrupt intended for the sub operating

system is generated and the main operating system determines based on the status

table that the sub operating system is in the interrupt disabled state, registers the

interrupt in the status table as a reserved interrupt (Col. 19, Lines 21-26).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to combine the teachings of Tanaka with those of England, Nota, and

Brelsford in order to allow for England's, Nota's, and Brelsford's main operating system

to have greater flexibility in how to treat different interrupts, based on their individual

circumstances.

29.   As per claim 11, it is a method claim of apparatus claim 5. Therefore, it is

rejected for the same reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to GREGORY A. KESSLER whose telephone number is

(571)270-7762. The examiner can normally be reached on Monday - Friday, 7:30 a.m. -

5:00 p.m., alternate Fridays, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Emerson Puente can be reached on (571)272-3652. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Emerson C Puente/   /GREGORY A KESSLER/
Supervisory Patent Examiner, Art Unit 2195   Examiner, Art Unit 2195